ECO

NOAA Trust Resources

The habitats of primary concern to NOAA are the surface water and sediments of Bound Brook. Contaminated wetlands within Dismal Swamp discharge into a small, unnamed stream approximately 290 m (950 ft) from where the leaking capacitors were found. The unnamed stream flows approximately 0.8 km (0.5 mi) before emptying into Bound Brook. The location of the unnamed stream could not be determined from the documents reviewed to prepare this report. Bound Brook flows approximately 12 km (7.5 mi) before converging with Green Brook, which continues to flow approximately 4.7 km (2.9 mi) to the Raritan River. The Raritan River flows approximately 32 km (20 mi) before discharging into the Atlantic Ocean (Figure 1).

The Dismal Swamp wetland is designated as "priority wetlands" by the U.S. Fish and Wildlife Service and the USEPA. In addition, the wetland represents a "highly valued resource," because it is one of the few wetland ecosystems remaining in the highly urbanized area of northern Middlesex County, and it is the largest natural wildlife refuge in this area (USEPA 2001).

Bound Brook is a low-gradient stream that supports a variety of warm water resident fish. Bass, bluegill, brown bullhead, goldfish, pumpkinseed, redbreast sunfish, shiner, tessellated darter, and white sucker are all commonly found in Bound Brook (Barno 2002). The New Market Dam on Bound Brook forms New Market Pond (Figure 1). The dam is approximately 6 km (3.7 mi) downstream of the Woodbrook site. New Market Dam lacks fish passage facilities and so is impassable to anadromous fish. Bound Brook and the small, unnamed stream are suitable habitats for alewife and blueback herring runs, but the New Market Dam impedes their migration (Barno 2002). During September 1999, Tropical Storm Floyd, and the floodwaters brought on by the storm, caused damage to the New Market Dam. The Township of Piscataway was awarded a grant for rehabilitation of the dam; however, it is currently unknown whether this rehabilitation will include installing fish passage facilities (Ritchey 2003). The catadromous American eel is able to traverse the dam and has been documented throughout Bound Brook (Barno 2002). The Fieldsville Dam on the Raritan River near the Township of Piscataway has been breached so Bound Brook, Green Brook, and the Raritan River now flow freely below the New Market Dam.

Although there are no plans to restore Bound Brook for use by anadromous fish species, active restoration is occurring in the Raritan River. NOAA trust resources in the Raritan River basin are listed in Table 1. American shad from the Delaware River basin have been transplanted to the Raritan River in efforts to reestablish a spawning population. Historically, anadromous alewife and blueback herring have also used the Raritan River basin. These species are not being actively restored, but it is possible with continued water quality improvement that they will reestablish themselves (Barno 2002). The American eel is found in Bound Brook and the Raritan River.

Recreational fishing of freshwater species takes place in Bound Brook, especially at New Market Pond. Recreational fishing of American shad and striped bass occurs in sections of the Raritan River downstream of the site. No commercial fishing takes place within the Raritan River (Barno 2002).

Table 1. NOAA trust resources found in the Raritan River Basin (Barno 2002). The migration of anadromous fish into Bound Brook is impeded by the New Market Dam.

Species		Habitat Use			Fisheries	
Common Name	Scientific Name	Spawning Area	Nursery Area	Adult Habitat	Comm.	Rec.
ANADROMOUS FISH						
Alewife	*Alosa pseudoharengus*	◆	◆			
American shad	*Alosa sapidissma*	◆	◆			◆
Blueback herring	*Alosa aestivalis*	◆	◆			
Striped bass	*Morone saxitilis*	◆	◆			◆
CATADROMOUS FISH						
American eel	*Anguilla rostrata*			◆		

A fish consumption advisory is in effect for the entire length of Bound Brook, including New Market Pond, because of elevated levels of PCBs and dioxins detected in fish tissue. The New Jersey Department of Environmental Protection (NJDEP) recommends that people not eat fish taken from Bound Brook (NJDEP 2004). A fish-consumption advisory is also in effect for American eel, American lobster, blue crab, bluefish, striped bass, white catfish, and white perch within the lower portion of the Raritan River, downstream of New Brunswick (Figure 1). The advisory is in place because of elevated levels of PCBs and dioxins in fish tissues. The NJDEP further recommends:

- that the general public consume no more than one meal of American eel per year and that high-risk populations avoid consuming American eel from the lower portion of the Raritan River;
- that the general public consume no more than four meals of white perch and white catfish per year and that high-risk populations avoid consuming white perch and white catfish;
- that the general public consume no more than four meals per year of bluefish over 2.7 kg/61 cm (6 lb/24 in) and no more than one meal per month of bluefish under 2.7 kg/61cm (6 lb/24 in) and that high-risk populations avoid consuming bluefish of any size;
- that the general public consume no more than one meal per month of striped bass and that high-risk populations avoid consuming striped bass;
- that the general public consume no more than six blue crabs per week and that high-risk populations consume no more than three blue crabs per month; and
- that all populations avoid consuming the hepatopancreas of blue crab and discard the cooking liquid and that all populations avoid consuming the hepatopancreas of American lobster (NJDEP 2004).

Site-Related Contamination

During July and August 2000, the USEPA Region II Superfund Technical Assistance and Response Team (START) collected surface water, sediment, groundwater, and soil samples from the Woodbrook site. The samples were analyzed for metals, polycyclic aromatic hydrocarbons (PAHs), pesticides, and PCBs (Charters et al. 2001). Based on the results of these analyses, the primary contaminants of concern to NOAA are metals, PAHs, and PCBs. Surface water and sediment samples were taken from the wetland, Bound Brook, and the small, unnamed stream near the area where the leaking capacitors were found. Groundwater samples were taken from temporary monitoring wells throughout the site and from off-site domestic water spigots. Soil samples were taken from throughout the site. Table 2 summarizes the maximum concentrations of contaminants of concern to NOAA and compares them to relevant screening guidelines. Only concentrations that exceeded the screening guidelines are discussed below. Site-specific or regionally specific screening guidelines are always used when available. In the absence of such guidance, the screening guidelines for soil are the Oak Ridge National Laboratory final preliminary remediation goals (ORNL-PRGs; Efroymson et al. 1997). The screening guidelines for surface water and groundwater are the ambient water quality criteria (AWQC; USEPA 2002). The screening guidelines for sediment are the threshold effects concentrations (TECs; MacDonald et al. 2000). Exceptions to these screening guidelines are noted in Table 2.

Surface Water

Metals, pesticides, and PCBs were detected in surface water samples taken from Bound Brook and the small, unnamed stream. The maximum concentration of cadmium was detected in a sample taken from Bound Brook downstream of the site, while the maximum concentrations of copper and lead were detected in samples taken from the small, unnamed stream. Cadmium and lead maximum concentrations exceeded the AWQC by one order of magnitude (Table 2). Copper concentrations exceeded the AWQC by a factor of two.

The PCB Aroclor 1254 was detected in a sample taken from the small stream and exceeded the AWQC by one order of magnitude (Table 2). The pesticide 4,4'-DDT was detected in a sample taken from Bound Brook downstream of the site at a concentration that exceeded the AWQC by a factor of three.

Sediment

Metals, PAHs, pesticides, and PCBs were detected in sediment samples taken from Bound Brook and the small, unnamed stream. The maximum concentration of cadmium was detected in a sample taken from Bound Brook downstream of the site. Arsenic, chromium, copper, lead, mercury, nickel, selenium, silver, and zinc were detected at maximum concentrations in samples taken from the small, unnamed stream. Cadmium, lead, and mercury concentrations exceeded the TECs by one order of magnitude (Table 2). Concentrations of copper, zinc, nickel, and chromium exceeded the TECs by factors of approximately nine, six, two, and 1.5, respectively. Concentrations of arsenic and silver slightly exceeded the TECs. No TEC is available for comparison to the maximum concentration of selenium found in the sediment samples.

Maximum concentrations of PAHs detected in sediment samples ranged from 0.3 mg/kg to 5.4 mg/kg (Table 2). The maximum concentrations of seven of the eight detected PAHs (Table 2) exceeded the TECs by one order of magnitude. The maximum concentration of one PAH (fluorene) exceeded the TEC by a factor of four.